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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/644,966	08/21/2003	Koji Nakazawa	101175-00034	7581

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EXAMINER
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ZHENG, LOIS L

ART UNIT	PAPER NUMBER
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1742

DATE MAILED: 10/05/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/644,966

Applicant(s)

NAKAZAWA ET AL.

Examiner

Lois Zheng

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 31 August 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-3 and 5-10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 5-10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 31 August 2006 has been entered.

### ***Status of Claims***

2. New claims 6-10 are added in view of the amendment filed 31 August 2006. Claim 4 is canceled in view of the amendment. Therefore, claims 1-3 and 5-10 remain under examination.

### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 6-10 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claim 6 recites that "said purifying means is only in communication with said water electrolysis means and said gas/liquid separating means". However, claim 6 also recited a backflow means. According to the instant specification, the claimed purifying means is also connected to the backflow means. Therefore, claim 6 is not supported by the original specification.

In addition, the meaning of "in communication" is vague since it is unclear to one of ordinary skill in the art that the type of communication applicant is claiming is a physical connection, a fluid communication or an electrical communication/connection.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-3 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moulthrop, Jr. et al. US 6,383,361 B1(Moulthrop) in view of Cisar et al. US 5,635,039 (Cisar), or further in view of Casson US 3,720,164(Casson).

Moulthrop teaches a water electrolysis system comprising an electrolysis cell stack(Fig. 4 numeral 61), an oxygen/water separation tank(Fig. 4 numeral 100) and a phrase separation tank(Fig. 4 numeral 82).

Regarding claim 1, the electrolysis cell stack of Moulthrop reads on the claimed water electrolysis means. The oxygen/water separation tank of Molthrop reads on the claimed gas/liquid separation means. Moulthrop further teaches that the water exiting

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from the phrase separation tank is pumped back into the electrolysis cell(Fig. 4 numerals 102, 72 & 94, col. 4 lines 36-38). Therefore, pumps 102 & 72 as shown in Fig. 4 of Moulthrop read on the claimed backflow means. Moulthrop further teaches that the oxygen/water exiting from the electrolysis cell stack is introduced to the oxygen/water separation tank(Fig. 4 numerals 98 & 100, col. 4 lines 40-42). Therefore, the claimed discharge open is inherently present in the cell stack of Moulthrop. The oxygen/water separation tank(i.e. gas/liquid separation means) of Moulthrop is directly connected to the discharge opening through which the oxygen/water mixture is brought out from the cell stack(i.e. water electrolysis means).

However, Moulthrop does not explicitly teach the water electrolysis cell stack comprises the claimed pair of catalyst layers separated by an electrolyte membrane. Moulthrop also does not explicitly teach no intermediate piping for the gas/liquid mixture of oxygen and pure water brought out from the water electrolysis means. Moulthrop also does not explicitly teach the claimed pure water intake opening on the gas/liquid separating means.

Cisar teaches an electrochemical cell that can be used as a water electrolyzer (abstract, col. 1 lines 19-21, col. 28, lines 31-43). Cisar further teaches a pair of catalyzed electrodes separated by a proton exchange membrane(col. 5 line 62-col. 6 line 3, col. 8 line 20 – col. 9 line 32). Cisar further teaches a gas/liquid separator tank downstream from the water electrolyzer with an intake opening for makeup deionized water(Fig. 6 numerals 74 and 86, col. 18 lines 31-36).

Therefore, it would have been obvious to one of ordinary skill in the art to have incorporated the pairs of catalyzed electrodes separated by a proton exchange membrane as taught by Cisar into the water electrolysis system of Moulthrop in order to increase the performance of the electrochemical cell by as taught by Cisar(col. 9 lines 10-12). It would also have been obvious to one of ordinary skill in the art to have incorporated deionized water intake opening on the gas/liquid separator tank as taught by Cisar into the oxygen/water separation tank of Moulthrop in order to supply the makeup deionized water(i.e. mint pure water) to the electrolysis system as taught by Cisar.

Casson teaches using purified water in making corrosion resistant metallic lithographic plates(abstract). Casson further teaches that metal pipings and vessels can cause contaminations to the water(col. 4 lines 8-11).

Regarding the "intermediate piping" limitation, Moulthrop is silent about any intermediate piping between the electrolysis cell stack and the oxygen/water separation tank. Therefore, the examiner asserts that the oxygen/water mixture directly flows into the oxygen/water separation tank through the discharge opening without intermediate piping as claimed. Even if Moulthrop were to disclose the intermediate piping, it would have been obvious to one of ordinary skill in the art to have eliminate any possible intermediate piping between the water electrolysis cell and the gas/liquid separation means as taught by Moulthrop in view of Cisar in order to avoid any potential contamination of the water from the piping as taught by Casson.

In addition, the examiner is interpreting the claimed water electrolysis system as a one-piece system since both the claimed gas/liquid separating means and the electrolysis cell share a common wall. Therefore, one of ordinary skill in the art would have found the claimed one piece water electrolysis system an obvious engineering choice since the claimed water electrolysis system is simply a result of integrating the separate water electrolysis cell and the gas/liquid separation means as taught in the apparatus of Moulthrop in view of Cisar and Casson. In re Larson, 340 F.2d 965, 968, 144 USPQ 347, 349 (CCPA 1965). See 2144.04(V).

Furthermore, the claimed language "electrolyzes pure water supplied to said catalyst layers, and brings out hydrogen from one catalyst layer and brings out a gas/liquid mixture of oxygen and pure water from the other catalyst layer;" is interpreted as process limitations, therefore, does not lend patentability to instant claim 1. The water electrolysis system of Moulthrop in view of Cisar and Casson is inherently capable of performing the claimed process limitations since Moulthrop in view of Cisar and Casson teach a water electrolysis system that is the same as that of the instant invention.

Regarding claim 2, Moulthrop further teaches that the gas phase separation tank(Fig. 4 numeral 82) comprises ion exchange resin(Fig. 3 numeral 81) to remove any cationic and anionic impurities(col. 3 lines 11-17, col. 4 lines 32-33). Therefore, the ion exchange resin containing gas phase separation tank as taught by Moulthrop in view of Cisar and Casson reads on the claimed purifying means for purifying water with the aid of ion exchange resin wherein the purified water is flown back to the water electrolyzer.

Regarding claim 3, the examiner is interpreting the claimed water electrolysis system as a one-piece system since the claimed the electrolysis cell, the claimed gas/liquid separating means and the claimed gas phrase separation tank(i.e. purifying means) share common walls. Therefore, one of ordinary skill in the art would have found the claimed one piece water electrolysis system an obvious engineering choice since the claimed water electrolysis system is simply a result of integrating the water electrolysis cell, the oxygen/water separation tank(i.e. gas/liquid separation means) and the gas phrase separation tank(i.e. purifying means) as taught in the apparatus of Moulthrop in view of Cisar and Casson. In re Larson, 340 F.2d 965, 968, 144 USPQ 347, 349 (CCPA 1965). See 2144.04(V).

In addition, one of ordinary skill in the art would have found it obvious to place the purifying means of Moulthrop in view of Cisar and Casson next to the electrolysis cell, thereby sharing a common wall with the electrolysis cell, in order to eliminate the need for an intermediate piping to avoid potential contamination from the piping over time as taught by Casson.

Regarding claim 5, Moulthrop further teaches that the gas phrase separation tank(i.e. purifying means) comprises a filter medium(Fig. 3 numeral 84). Therefore, it would have been obvious to one of ordinary skill in the art to have incorporated the filter medium in the gas phrase separation tank of Moulthrop into the oxygen/water separation tank of Moulthrop in view of Cisar(i.e. gas/liquid separation means) in order to sufficiently removing particulates in the water such that the re-circulated water will not contaminate the electrochemical cell as taught by Moulthrop(col. 3 lines 19-23).



***Response to Arguments***

7. Applicant's arguments filed on 14 July 2006 and 31 August 2006 have been fully considered but they are not persuasive.

Applicant argues that mint pure water flows into the gas/liquid separating means from an intake opening, but Mouthrop teaches hydrogen saturated water flowing into tank (82).

The examiner does not find applicant's argument persuasive since the oxygen/water separation tank(100 in Fig. 4 of Moulthrop), which also comprises an intake opening for makeup deionized water, as taught by Mouthrop in view of Cisar and Casson reads on the claimed gas/liquid separating means. And the tank(82) as taught by Mouthrop reads on the claimed purifying means.

Regarding applicant's argument with respect to the differences in the ion exchange resin of Moulthrop and the ion exchange resin of the instant invention, the examiner does not find applicant's argument persuasive since applicant is discussing differences in the intended use of the ion exchange resin between Moulthrop and the instant invention without discussing actual structure differences the intended use language would have inherently caused. Since the instant claims are apparatus claims, the examiner does not consider applicant's argument persuasive absence of evidence showing structural differences between the ion exchange resin of Moulthrop and the ion exchange resin of the instant invention.

Regarding applicant's argument that Moulthrop does not teach that the oxygen and water mixture brought out from the water electrolysis means without any

intermediate piping, the examiner also does not find applicant's argument persuasive since Casson teaches negative effects of metal piping on water quality, which provides proper motivation for one of ordinary skill in the art to eliminate intermediate piping between the water electrolyzer and the oxygen/water separation tank of Moulthrop in view of Cisar.

Applicant's argument regarding Cisar and Casson are not persuasive since Applicant's rebuttal of primary Moulthrop reference is not persuasive.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lois Zheng whose telephone number is (571) 272-1248. The examiner can normally be reached on 8:30am - 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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